The Impacts of Deeper Regional Integration Options on North African economies with a special focus on poverty

By Mohamed Basset Chemingi and Nassim Oulmane

1. Introduction

The social unrest that has led to the "Arab Spring" that started in Tunisia and moves to Egypt and Libya has been mainly motivated by social tensions as result of high rates of unemployment, mainly among youth (particularly young educated people), poverty, and corruption. Even with an average rate of growth of near 5% during the last decade, North African countries were not able to tackle the challenges of unemployment and poverty. Indeed, the demographic specificity of the region, with its huge number of new young qualified workers on the labor market, implies that a higher level of pro-labor growth is needed to absorb this workforce.

North Africa is the African region which invests the most in higher education (on average 5% of the GDP) and which has reached an average schooling level of 75% in secondary education, and 20% for higher education. At the same time, the region has one of the highest unemployment rates in the world with a rate of 10.9% in 2011. However, unemployment rates are too heterogeneous over the region with 18,9% in Tunisia, 20% in Libya, 12.4% in Egypt, 8.1% in Morocco and 10% in Algeria.

The high unemployment rates in North African countries result first and foremost from the growing youth unemployment rate. In fact, 90% of the unemployed are between 15 and 29 years old and the unemployment rate for this age group is estimated at 27.1% in 2011[1]. For comparative purpose, the youth are three times more likely to be unemployed than adults over the world. However, in North Africa, youth are four times more likely to be unemployed than adults. Moreover, youth unemployment in North Africa increased significantly in the past two years[2] and much higher than any other region in the world.

A deeper level of regional integration in North Africa is usually presented as a means to reach a significant higher level of growth to meet this unemployment challenge. The political obstacles towards the establishment of a real regional integration of Nord African countries has been seen as one among other factors which could explain the decline of the old growth models followed by these countries since their independencies. The "Arab Spring" can operate as a new context to overcome the political constraints and to deepen the regional integration process.

The objective of this paper is to provide an evaluation of recent trends of intra-trade among North African countries over the past decade and to assess the impacts of deeper regional integration taking into account reducing technical barriers to trade. The impacts will covers GDP, sectoral trade an production, unemployment and poverty.

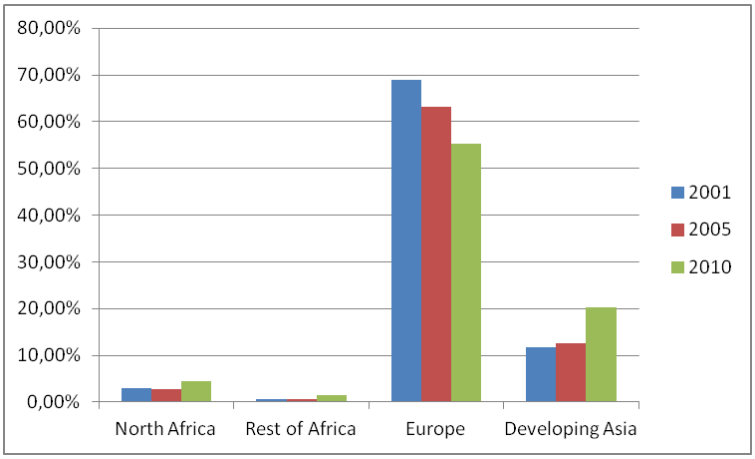
2. Trade in North Africa: Structure, Trends and Regulations

2.1. An aggregate view. In North Africa, the trade continues to be dominated by the weight of the European Union. Despite a slight reduction in the relative value which was observed throughout the decade, Europe remains the main client and main provider to North Africa, with 55.2% of exports and 45% of imports in 2010. For manufactured products, these rates are 55.6% and 49.5% respectively. This position should remain predominant in the medium term, due to the geographic proximity of the

[1] Global employment trends, 2012 ILO
[2] Economic and Social conditions 2011, ECA North Africa Office.

European market, delocalisation opportunities offered by the proximity, and the trade creation effect which should result in partnership agreements concluded or in negotiation between certain North African countries and European Union, within the Euromed partnership framework. Comparatively, intra-North African trade remains marginal, notwithstanding the fact that the absolute value of exports doubled between 2005 and 2010.

Figure1: Shares of partners in North Africa trade



Source: UN comtrade

The figures in table 1 and 2 illustrate that intra-North African trade remains low. In relative terms, this foreign exchange market configuration in North Africa gives a good illustration of the very weak positioning of North African products in the regional market and within the continent. Compared to the trade with developing Asia countries, the intra regional trade dynamic is still insufficient, despite acceleration during the last years.

Table 1: Changes and distribution of merchandise exports in North Africa (in US billion)

In US billion	North Africa	Rest of Africa	Europe	World
2001	1,495	0,33	34,399	49,85
2005	3,156	0,721	71,173	112,483
2010	7,848	2,745	96,185	174,213
In %	North Africa	Rest of Africa	Europe	Developing Asia
2001	2,90%	0,60%	69,00%	11,80%
2005	2,80%	0,60%	63,20%	12,50%
2010	4,50%	1,50%	55,20%	20,30%

Table 2: Changes and distribution of merchandise imports in North Africa

US Billion	North Africa	Rest of Africa	Europe	World
2001	1.538	0.698	27.505	48.8
2005	3.970	1.029	44.694	89.6
2010	8.517	2.576	83.611	185.7

In %	North Africa	Rest of Africa	Europe	Developing Asia
2001	3.1%	1.4%	56.3%	17.4%
2005	4.4%	1.1%	49.8%	23.4%
2010	4.5%	1.3%	45.0%	30.2%

The national figures give a situation which is relatively contrasting between the States in the region. Egypt and Tunisia both display double digit export rates to North Africa (10.5 and 11.9% in 2010), very close to the intra-African export average (12.9%). For the five other countries, the North African region does not at the moment represent a significant trade market, despite the improvement recorded in 2010 on the flow from Morocco and Mauritania to the rest of the Continent (7.2% and 6.4% compared to 4.6% and 1.8% in 2009).

Table 3: African and North African shares in the region's exports in 2010

	Total exports in bil. $EU	North African Share	Total African Share
Algeria	57.1	3.01 %	3.2 %
Egypt	25.0	10.5 %	16.2 %
Libya	41.8	2.5 %	2.6 %
Morocco	17.8	2.1 %	7.2 %
Mauritania	2.1	0.4 %	6.4 %
Sudan	11.4	0.7 %	2.0 %
Tunisia	16.4	11.9 %	13.1 %
North Africa	171.3	4.5 %	6.3 %

Source: ECA; African Trade Compendium Trade 2011.

In relative terms, the decline in the European share in the total import in North African States did not help the products originating from the region, as their ratio progressed very little in ten years, and the share of the rest of the Continent dropped slightly. However, the distribution per country of the 2010 data shows a noticeable 'North African' regional demand from Libya (11% of its total imports) and to a lesser extent from Sudan (8.6%) and Tunisia (7.2%). On a continental scale, Sudan is in the lead with an intra-African trade opening rate of 16.2%, followed by Libya (11.1%) and Mauritania (10.4%). For the other countries in the region, the share of products coming from Sub-Saharan Africa fluctuates between 0.4% (Tunisia) and 1.8% (Algeria), far below the continental average (13.3%).

Table 4: African and North African shares in the region's imports in 2010

	Total imports in bil. $EU	Intra-North African (in %)	Intra-African (in %)
Algeria	40.9	1.3 %	3.1 %
Egypt	53.0	1.7 %	3.2 %
Libya	24.3	11.0 %	11.1 %
Morocco	35.4	4.4 %	5.9 %
Mauritania	1.7	4.8 %	10.4 %
Sudan	9.9	8.6 %	16.2 %
Tunisia	22.0	7.2 %	7.6 %
North Africa	187.1	4.4 %	6.0 %

Source: UNCTAD Stat 2011

Over the 2001-2010 decade, the share of intra-North African trade flows in the total trade of the region reached just under 5%, and the table below relative to the intra-Regional Economic

Communities (RECs) exchanges gives a good illustration of the low level of trade opening between the countries in the region.

Table 5: 2009 Intra-African trade share; per RECs ; in %

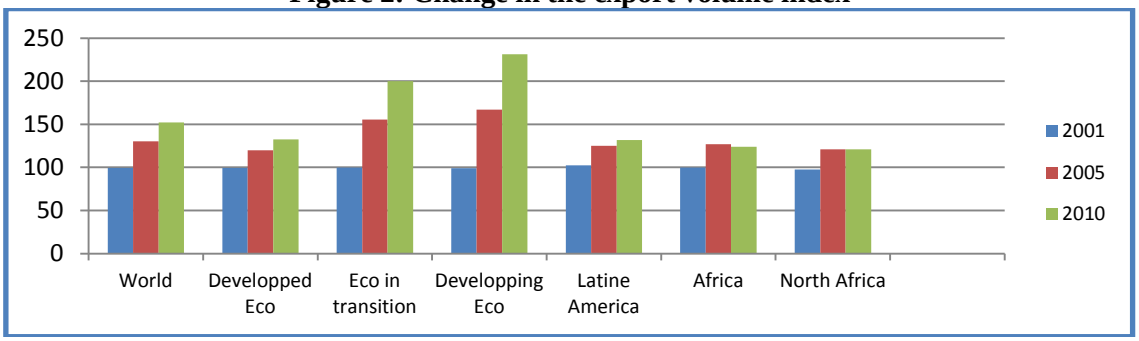
Zone	UMA	CEMAC	COMESA	ECCAS	ECOWAS	SADC	UEMOA	Africa
UMA	**3.1**	0.2	1.7	0.2	0.7	0.1	0.5	4.8
CEMAC	0.4	**1.2**	0.3	1.4	1.1	0.7	0.4	3.4
COMESA	3.3	0.1	**7.1**	1.6	0.4	4.3	0.2	12.1
ECCAS	0.2	0.5	1.2	**0.7**	0.5	3.3	0.2	4.7
ECOWAS	0.4	1.6	0.2	1.9	**9.9**	3.2	5.5	15.2
SADC	0.3	0.2	7.3	1.9	1.4	**13.9**	0.3	17.3
UEMOA	1.7	2.5	0.8	3.3	27.1	1.3	**13.2**	32.7
AFRICA	1.7	0.5	4.0	1.4	2.8	5.3	1.4	**12.0**

Source: AfdB-ECA-AU Statistical Yearbook; 2011 Edition

When comparing all of the data, it appears that North Africa, and its main REC UMA, is one of the regions which trades the least with itself and with the rest of the Continent. This counter-performance also opens real prospects for a sustainable recovery of the goods and services balances and the current account balances of most States. With an estimated population in 2010 of approximately 220 million inhabitants for the seven North African countries, an average regional GDP of more than 6,000 dollars per inhabitant, continuity of the physical space and a good level of transport infrastructure, the region has the key determining factors to build a high-performing regional market. Their optimisation will take place through rapid implementation of existing or scheduled trade liberalisation schemes in North Africa, greater mobility of factors between the States and the negotiation of preferential trade agreements with the other regions of the Continent, West Africa and Central Africa in particular, especially since the signing of a tripartite agreement in June 2011 between SADC, COMESA and EAC planning on the rapid implementation of a free exchange zone between the 26 member countries of the Southern and East African RECs.

The dynamic of the North African Trade represented by the changes in export and import indices show a weak performance level in the external sector of the region, compared to other developing economies. Using the year 2000 as a reference, and despite the triple increase of the total export value, the index for the exportation volume in North Africa recorded a slight change between 2001 and 2010, by increasing from 97.5 to 121.1, slightly below the continental average, and far below that of developing countries in Asia.

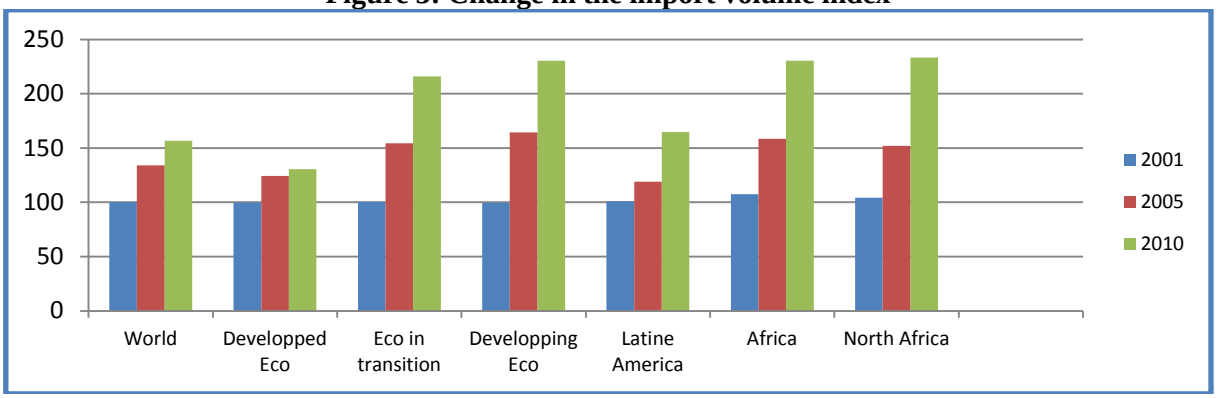
Figure 2: Change in the export volume index



Source: UNCTAD Stat 2011

On the contrary, and for the same reference period, the import volume index for the region recorded the highest rise, increasing from 104.4 in 2001 to 233.5 in 2010

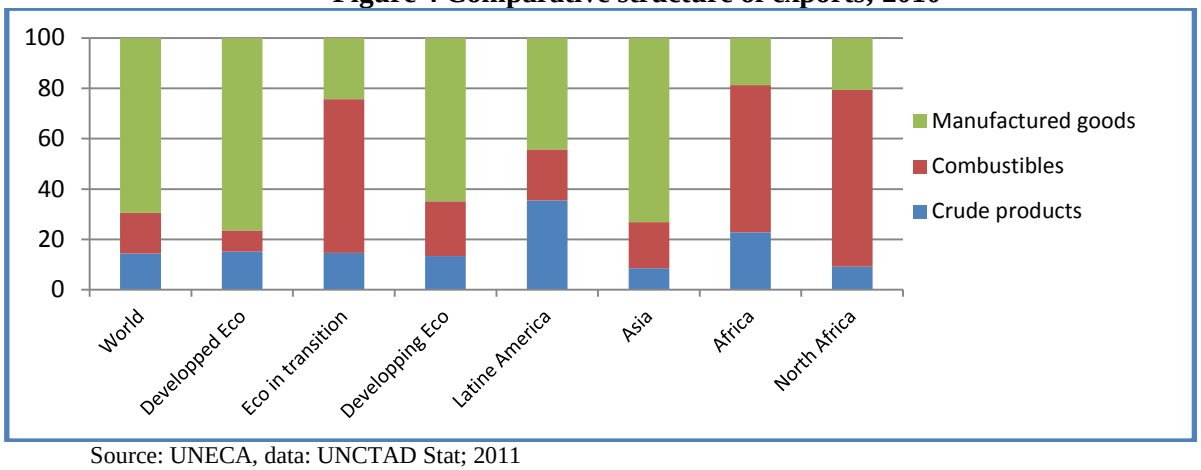
Figure 3: Change in the import volume index



Source: UNCTAD Stat 2011

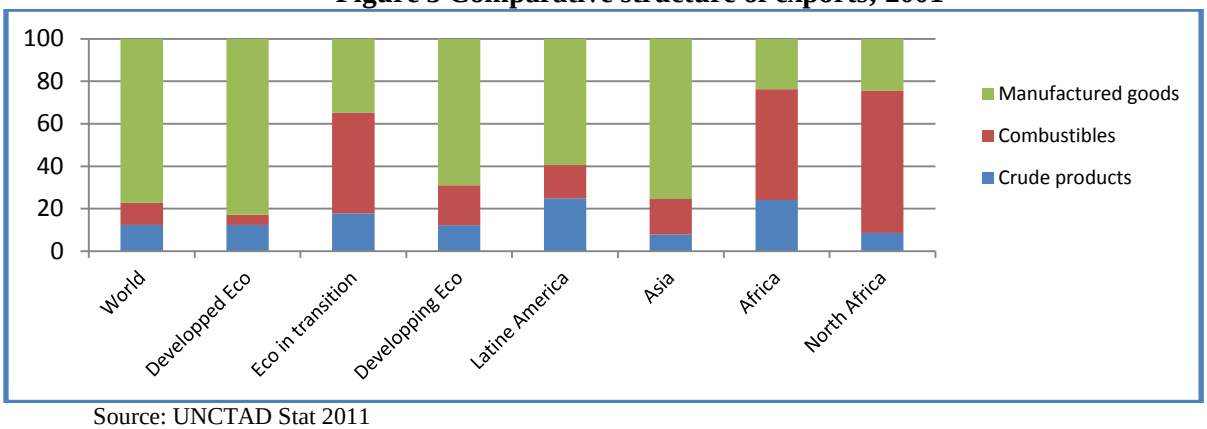
Extractive sectors, through crude hydrocarbons and other basic products, remains predominant in the export structure of the North African region. In relative terms, this importance increased during the 2001-2010 decade, from 75.6% to 79.3% of total exports. On the scale of the countries, the share of hydrocarbons in 2010 exports was 98% for Algeria, 97% for Libya, 78.2% for Sudan, 43.1% for Egypt, 17.7% for Tunisia and 8.7% for Mauritania respectively. Correlatively, the share of manufactured items dropped slightly, from 24.4 to 20.7% between 2001 and 2010.

Figure 4 Comparative structure of exports; 2010



Source: UNECA, data: UNCTAD Stat; 2011

Figure 5 Comparative structure of exports; 2001



Source: UNCTAD Stat 2011

The ratios given by the two graphs for North Africa remain close to those of the rest of the African continent, and have a reverse symmetry to those of Asia and all the developing economies.

2.2. A detailed view. To understand the commodity structure of the recent changes in intra-trade among North African countries and the potential of trade if deeper integration among member countries will be implemented, an additional analysis at HS6 level has been carried out. To do so, various indicators related to trade iversification, penetration, specialisation and potential of exports have been estimated for the region of North Africa.

To be completed

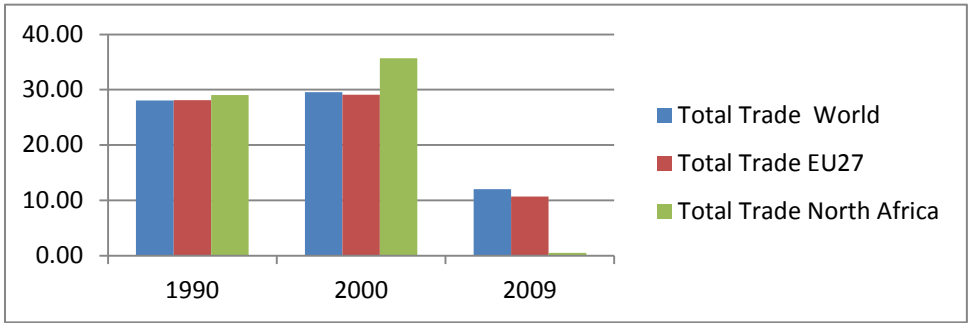
2.3. Protection. In term of protection, North Africa has reduced significantly its protection during the first decade of the 21st century (see figure 6). Indeed during this period the countries of the region have implemented several trade agreements at the bilateral or regional level.

Except Libya, All North African countries have a trade agreement with their main trade partner, the EU, either within the Euromed framework (Algeria, Egypt, Morocco and Tunisia) or through the ACP Framework that will be replaced by the ongoing negotiations on the Economic Partnership Agreements (Mauritania, Sudan). These agreements have started with the non agricultural products, and the tariff dismantlement has been conducted only on manufactured products for the first countries that have signed an agreement (Tunisia 1995 and Morocco 1996).

All North African countries, except Mauritania, are also member of the Great Arab Free Trade Area (GAFTA) zone. Between 2005 and 2008, all tariff barriers have been removed, but with sensitive lists (particularly on agricultural products, and oil related chemicals). This agreement and the Agadir Agreement between Egypt, Jordan, Morocco and Tunisia, have contributed to reduce significantly the tariff protection between North African countries.

Indeed, for North Africa, while the average applied tariff rate in 1990 and 2000 was higher for the region that for the EU or the world, it has been reduced from more 35% in average to less than 1%. In the mean time, the tariffs for the other partners have been reduced by near three times.

Figure 6: Average applied tariff by North African countries (1990-2009)

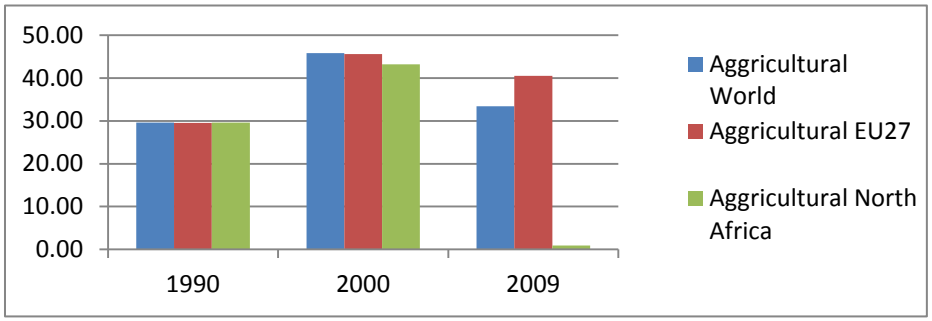


Source : Trains

These countries have also bilateral agreements with non regional countries as with the USA (Morocco 2004) or Turkey (Morocco 2004 and Tunisia 2004). At the regional level, North African Countries belongs to Regional Economic Communities (RECs). Algeria, Libya, Mauritania, Morocco and Tunisia are the five members of the UMA for which the FTA is still not effective, while Egypt Libya and Sudan are members of the Common Market for Eastern and Southern Africa (COMESA). Finally, except Algeria, all North African countries are member of the CEN-SAD, however this REC doesn't succeed to implement it's FTA.

When we consider agricultural products, figure 7 shows that the average applied tariffs have been increased during the 90s and then have been reduced significantly during the following decade for other north African countries, while the tariff protection remains quiet important for European products.

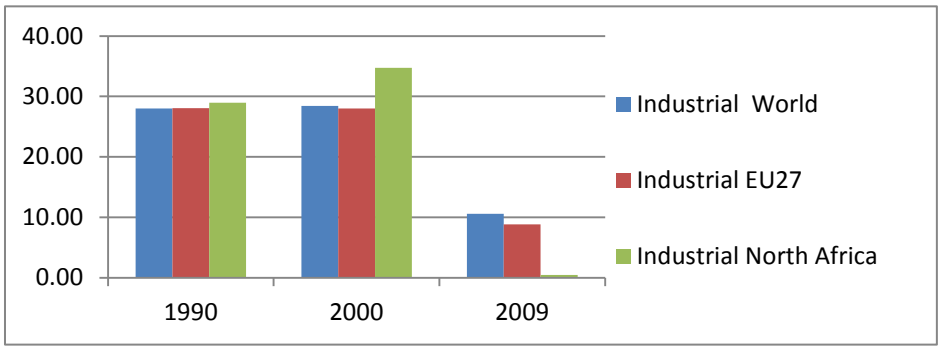
Figure 7: Average applied tariff by North African countries for Agricultural products (1990-2009)



Source: Trains

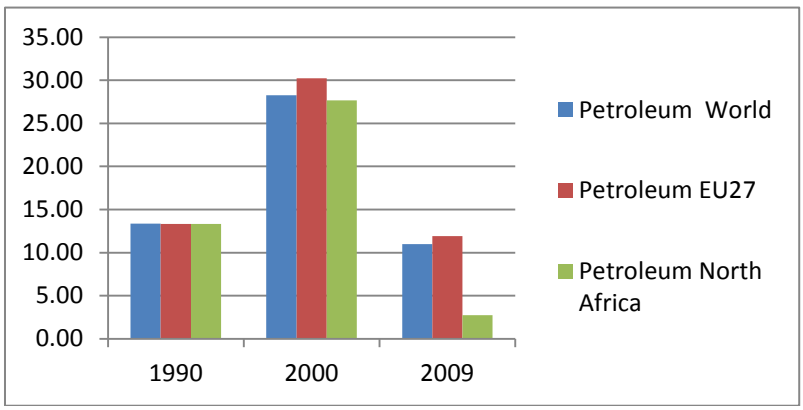
For industrial products one could note that the increase during the 90s has concerned only inra-regional trade while the tariff protection for industrial products remained quiet the same for the rest of the world. However, the implementation of the GAFTA and regional agreements has dramatically reduced the intra-regional protection (average applied tariff close to zero) as illustrated in figure 7.

Figure 8: Average applied tariff by North African countries for industrial products (1990-2009)



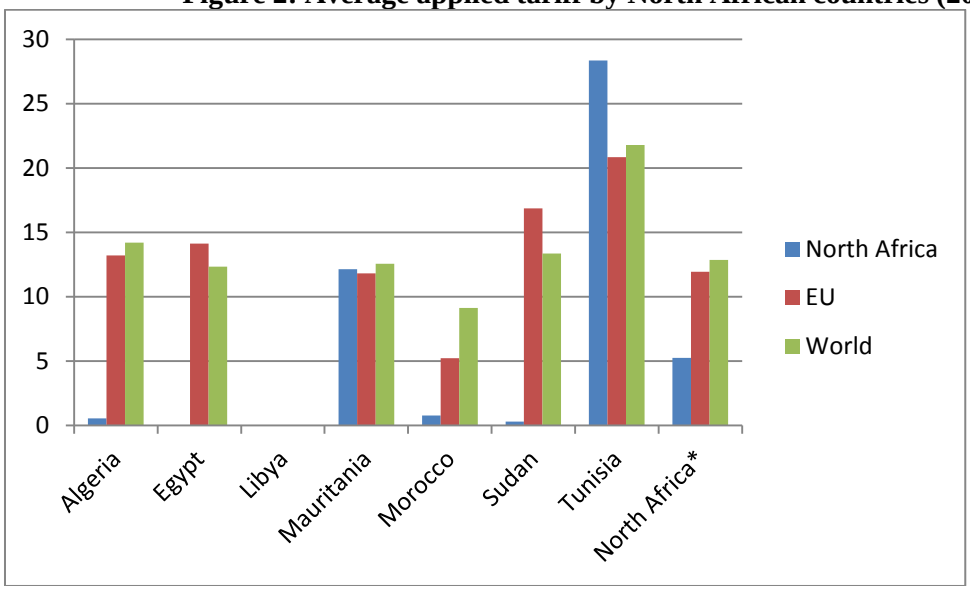
Source: Trains

As we have seen, the share of hydrocarbons and oil related products is important in the total exports of the region. Figure 8 shows that the average applied tariffs for these products varied significantly during the period, with a strong increase in the 90s followed by an important reduction that was more pronounced for other North African countries.



At the country level the majority of countries are applying very low tariffs compared to the EU and the world. Only Tunisia and Mauretania have average applied rates for North Africa higher than the applied average rate for the main partner, i.e. the EU.

Figure 2: Average applied tariff by North African countries (2009*)



Source: Trains
*2008 for Tunisia, 2007 for Libya.

Despite the strong tariff reduction applied for North African products within the region the share of intra-regional trade remains small, and the market access could be significantly improved only by tackling other kind of barriers.

3. Estimating the impact of deeper integration among North Africa countries

3**.1. Modeling regional integration.** The paper uses the MIRAGE computable general equilibrium models and the GTAP and MacMap world trade data sets. The GTAP (Global Trade Analysis Project) database is a global database that includes information on bilateral trade, transport and protection linkages among 112 regions for more than 50 commodity groups for the year of 2004. The MacMAP (Market Access Map) database covers market access by importing country, product, exporting country, and instrument of protection. It includes all preferential schemes and regional agreements among all the countries considered individually. The commodity coverage includes 5111 products (Harmonized System at the 6 digit level, HS6), with market access trade for 163 countries by 208 partners. Data corresponds to the year 2004. From this data we use applied tariffs, which are different from WTO bound or nominal tariffs and correspond to the actual payment of tariffs when goods cross borders. The MIRAGE model was designed to assess the impact of globalization on countries and regions around the world. The main features of the model correspond to those of the new generation of CGE models closely linked to social accounting matrices. For the purpose of these estimations we aggregated the data to 28 regions/countries and 27 commodity groups.

The MIRAGE model is a recursive dynamic model that uses the equilibrium condition achieved in the prior step to arrive at the next equilibrium. The modeling considers the current accounts of regions and countries as exogenous and lets the exchange rate adjust the economy to the predetermined real current account deficit or surplus. The public deficit or surplus is kept fixed and equal to that observed in the base year. The model thus adjust the sum of taxes/subsides from household revenue to match the predetermined public deficit position. The dynamics in MIRAGE depends on exogenous variables, such as the growth rate of the population and the population that is of working age, which means that the solution does not depend on forward-looking variables, such as investment or productivity. The global model features three factors of production: capital, land and

natural resources. There are two types of labour distinguished by the combination of sector and type of occupation that define workers, which broadly correspond to what we call basic skills (those suitable for agriculture and manual tasks), and more elaborated skills (those required for industrial and service tasks). The model solves for the total payments of wages by a sector based on the change in sector activity and the relative wage rate.

The MIRAGE model was used to evaluate the impact of alternative scenarios of regional integration in North Africa. The scenarios are solved as a sequence of static equilibrium, with the periods being linked by dynamic variables — population and labour growth, capital accumulation, and productivity. Policy scenarios are compared to a baseline scenario. In what fellows, we present briefly the main features of the MIRAGE version used in this study.

Demand side. For each region or country, demand is modelled through a representative agent, whose utility function is intra-temporal, with a fixed share of the regional income allocated to savings. The rest of the available income is used to purchase final consumption. Below a first-tier Cobb-Douglas function, consumption trade-off across sectors is represented through a LES-CES function. Each sectoral sub-utility function is a nesting of CES functions, comparable to the standard nested Armington – Dixit-Stiglitz function (see e.g. Harrison et al., 1997), with two exceptions. First, domestic products are assumed to benefit from a specific status within consumers, making them less substitutable to foreign products. Second, products originating from developing countries and developed countries are assumed to belong to different quality ranges.[3]

Production side. Production is made through the uses of five factors: capital, labour (skilled and unskilled), land and natural resources. While the first three factors are generic, the last two are specific. The production function assumes perfect complementarity between value-added and intermediate consumption. The sectoral composition of the intermediate consumption aggregate stems from a CES function. For each sector, the nesting is the same as for final consumption, which means that the sector bundle has the same structure for final and intermediate consumptions. The structure of value added is intended to take into account the well-known skill-capital relative complementarity. These two factors are thus bundled separately, with a lower elasticity of substitution (0.6), while a higher substitutability (1.1) is assumed between this bundle and other factors. Constant returns to scale and perfect competition are assumed to hold in agricultural sectors. The capital good is the same whatever the use sector, and capital is assumed to be perfectly mobile across sectors within each region or country. Natural resources are also perfectly immobile and may not be accumulated. Both types of labour (skilled and unskilled), as well as land, are assumed to be perfectly mobile across sectors. Production factors are assumed to be fully employed. All production factors are immobile internationally.

Poverty module. CGE models represent one of the best tools for poverty and incomes distribution analysis. Studies on poverty are often criticized for the choice of poverty or disparity indexes. In general equilibrium framework, we do not try to measure poverty indicators but rather the effects of economic reforms or external shocks on the changes of these indicators. Indeed, simulations are based on well-established estimations of poverty indicators (both poverty measures and growth elasticity of poverty measures) in order to connect simulations of economic policies to the poverty measures. In this version and to have comparative analysis for the considered panel of North African countries, we opted for the approach of growth elasticity for poverty reduction, which links the changes in the poverty measure (P0, P1, and P20) to the changes in mean consumption. Estimates of elasticity are taken from Chemingui and Bchir (2008). Using these estimates, the model generates the new levels of poverty measures from 2004 until 2020 both for the baseline and the alternative scenarios.

Dynamics. In a typical recursive dynamic framework, the time path of the model is solved as a sequence of static equilibrium in each year. In other words, the solution in any given year is not a function of forward looking variables, though it may be an explicit function of past variables, which are known and therefore exogenous. Despite the limitations of recursive dynamic framework,

[3] This is motivated by the fact that, following Abd-El-Rahman (1991), several empirical works have shown that, even at the most detailed level of classification (Combined Nomenclature, 10 digits, including more than 10,000 products), unit values differences are able to reveal quality differences (see e.g. Harfi et al., 1997; Fontagné et al., 1998; Greenaway and Torstensson, 2000).

particularly in the modeling of saving and investment behavior, it has at least one key advantage in its relative simplicity to set up and solve (van der Mensbrugghe, 1998).

Macroeconomic closure rules. The first closure assumes that the current accounts are exogenous for all countries and regions and equal to their initial values in real terms, while real exchange rates are endogenous and adjust to achieve the predetermined real current account deficits or surpluses. The second closure rule is related to government expenditure. The difference between public revenue and public consumption for a given region or country is supposed to be fixed and to increase over the time at the same rate of the world GDP. This assumption implies that the government has to adjust its revenue or his consumption each year in order to reach the predetermined exogenous public deficit or surplus. We assume that the lump sum taxes/subsides that governments punctuate from household revenue adjusts to match the predetermined level of government account.

Finally and compared with the standard version of MIRAGE, the version used here has two main additional features. The first is the separation between the government and household account while the second is the specific modelling of domestic support in agricultural activities. The first additional feature is a key determinant to analyse the impact of a given integration scenario on poverty. (See Bchir and Chemingui 2008 for a detailed presentation of the modified version of MIRAGE, 2008).

3.2. The selected model's dimensions (sectors, countries and time). The model has three dimensions: regions and countries (r), sectors (s) and time (t). For the regional details of the model, the selected level of disaggregation takes into account the objectives of this study itself in terms of including all North African countries individually, the other main trade partners of Africa, and the main economic players in the world. Table 1 displays the regional dimension of the model used in this study.

The sectoral dimension of the model focuses on trade in goods given the lack of data to integrate special scenarios of trade liberalization in services. Table 2 presents the sectoral details of the model. The individually selected sectors appear in the second column while the third column provides the corresponding sectors in the GTAP database. The first column presents the aggregate sector to which the specific sectors included in the model belong. Finally, regarding time dimension, the model is solved annually for the period 2004 to 2020.

Table 1: Regional dimension of the model

Region Code	**GTAP Region**
MAR	Morocco
EGY	Egypt
TUN	Tunisia
XNF	Rest of North Africa
RAF	Rest of Africa
USA	USA
BRA	Brazil
R_AM	Rest of America
EU27	UE 27
R_EU	Rest of Europe
JPN	Japan
CHN	China
IND	India
R_ASI	Rest of Asia

Table 2: Sectoral dimension of the model

	Sectors included individually in the model	The original GTAP Sector
Agriculture	Rice	Paddy rice; Processed rice
	Wheat	Wheat
	Cereal grains nec	Cereal grains nec
	Vegetables, fruit and nuts	Vegetables, fruit, nuts
	Oil seeds	Oil seeds
	Sugar	Sugar cane. sugar beet
	Animal products, forestry and fishing	Cattle, sheep, goats, horses; Animal products nec; Wool, silk-worm cocoons; Forestry; and Fishing.
	Raw milk	Raw milk
	Cotton	Plant-based fibers
	Crops nec	Crops nec
Manufacture	Coal, Oil and Gas	Coal; Oil; Gas
	Minerals nec	Minerals nec
	Meat and dairy products	Meat: cattle, sheep, goats, horse; Meat products nec; Dairy products
	Other manufacture food	Vegetable oils and fats; Food products nec
	Sugar	Sugar
	Textiles	Textiles Wearing apparel
	Beverages and tobacco products	Beverages and tobacco products
	Leather products	Leather products
	Wood products; Paper products and publishing	Wood products; Paper products; Publishing
	Petroleum and coal products	Petroleum, coal products
	Chemical, rubber and plastic products	Chemical, rubber, plastic prods
	Mineral products nec	Mineral products nec
	Other manufacture	Ferrous metals; Metals nec; Metal products; Manufactures nec
	Machinery	Motor vehicles and parts; Transport equipment nec; Electronic equipment; Machinery and equipment nec
Services	Electricity; Gas manufacture. Distribution	Electricity; Gas manufacture. distribution
	Transport	Trade; Transport nec; Sea transport; Air transport
	Other services	Water; Construction; Communication; Financial services nec; Insurance; Business services nec; Recreation and other services Pub Admin/Defense/Health/Educat. Dwellings;

3.3. The baseline scenario. The impacts of the alternative trade scenarios represent the changes compared to the baseline scenario. The baseline simulation is intended to present a most likely path of development for the North African economies over the simulation period 2004-2020 in the absence of the potential regional integration scenarios as well as the trade agreements that may be signed by this region with other partners. The construction of the baseline is intended to capture the influence not only of underlying demographic and economic factors, but also of key policy measures and reforms on the North African development paths, mainly the tariff liberalization entailed in the trade agreements already negotiated which have either been fully implemented or are in the process of implementation. Accordingly several assumptions have been made to define what seems to be the plausible development of the North African economies up to 2020. This exercise in simulation must not however be seen as an exercise in forecasting, for which general equilibrium models are not the best

tools. The definition of a benchmark using major exogenous hypotheses is intended merely to define a baseline scenario to which alternative policy scenarios can then be compared in order to isolate the specific impact of the latter. The fact that the value of the exogenous variables are set on *a priori* basis, within a realistic confidence interval, does not however have any major consequences. When the impact of alternative trade policies is assessed, it can be seen that these choices affect very little either amplitude or sign of the variations in the different aggregates relative to the baseline scenario.

The reference scenario is built using data from the World Development Indicators for the period 2004-2009 and World Bank Forecast for the period 2010-2020. The World Bank Global Forecast provides the yearly growth rates of the population, skilled and unskilled labour supplies and economic growth for the countries and regions individually included in the model for the period 2010-2020. In the reference scenario, the global productivity factor is considered as an endogenous variable where the economic growth rate is supposed to be exogenous. Once the model is runs on itself (calibration) it replicates the trends as initially projected by the World Bank. In addition, and given that applied tariffs in the GTAP7 are extracted from the Mac Map database 2, it implies that tariff reductions implemented before 2004 across countries and regions are assumed to be already active and explain in part the economic achievements observed in the base year for each country and region.

3.4. Alternative scenarios. Four sets of alternative scenarios have been tested using the MIRAGE model. The first set assumes that North African region is involved in various integration schemes in the form of implementation of free trade agreements. The first scheme assumes that tariffs on intra trade North African trade are removed while protection on imports from the rest of the world is unchanged. The second scheme assumes the implementation of an Africa-wide Free Trade Area where all African member countries and subregions are assumed to remove all tariffs on their bilateral imports from all Africa (intra-African trade). Once again, protection on African imports from the rest of the world (ROW) is unchanged. In the third scheme, North-African countries will implement individually FTAs with their main trade partners, namely China, European Union, and United States. The implementation of these FTAs supposes that both North African countries and their partners removed all kind of protection on their bilateral trade.

Instead of limiting integration to the removal of protection on bilateral trade according the scope of the agreement, the second set of scenarios added an improvement in the infrastructure linked directly to trade operations. In terms of modeling, this was implemented through a reduction of transport costs on international trade between each couple of countries in the region of North Africa. Practically, we assumed a reduction of 5 percent of the cost of transports on North African bilateral trade with the major partners outside the region. For the scenarios of regional integration, tariff reductions are implemented in combination with a downward adjustment of transport costs on bilateral trade to their lowest level observed in the North African region at the commodity level. In other terms, we are assuming that Nortth African countries will improve their infrastructure and reduce technical barriers to trade at the best level achieved by the most performing member country. The third set of scenarios assumed that North African countries will implement custom union on imports from the rest of the world while trade among member countries is totally liberalized. These scenarios are implemented with the assumption of a reduction of technical barriers to trade through lower transport costs as explained above. The custom-union scheme is implemented at the regional level through a downward adjustment of tariffs applied by member countries to their lowest levels by commodity observed in the lower protecting country. The adoption of this approach is motivated by two mains reasons. First, on a political level, it is almost impossible that member countries align their tariffs to the highest observed in the region due to international commitments either under the WTO or other bilateral agreements. Second, and given the high tariff dispersion among countries, adjusting tariffs to the highest level means introducing an important shock to the economy that may not generate a solution.

3.5. Results. This section presents the results of an exercise that estimates the impact of alternative paths of regional integration on North African countries. It considers the welfare benefits that would accrue to the North African countries if they were to integrate within themselves. The model simulates the impact of reduced and harmonized tariffs, supplemented by lower transportation costs within the

region. The simulations therefore proxy the impacts of integration processes that extend beyond simple trade liberalization.

Estimating the impact of policy decisions that are likely to have a wide range of economic and social effects is a challenging task. We use general equilibrium techniques because they provide a comprehensive framework that includes most of the relevant inter-relations of market economies and take into account immediate and second-round effects. In real life, policy interventions are usually accompanied by a variety of other changes. The model isolates the impact of individual policy changes, assuming that everything else in the economy remains unchanged. This is perhaps both the major weakness and the major strength of the technique: it illustrates the likely effect of a single policy intervention. The modeling technique relies heavily on changes in prices and their effects on supply and demand under simplified assumptions.

TO BE COMPLETED

Conclusions and policy implications: TO BE WRITTEN

References: TO BE COMPLETED

Annexe 1

Youth unemployment in some regions			
Régions	**2009 (%)**	**2010 (%)**	**2011 (%)**
North Africa	23.6	25.0	**27.1 2**
Middle East	25.2	25.4	**24.5**
Sub Saharian Africa	12.9	12.8	**12.4**
S-E Asia and Pacific	13.9	13.6	**12.6**
South Asia	9.1	10.2	**9.3**
World	**12.8**	**12.8**	**12.7**

Source: National Data (Economic and Social conditions, ECA 2012), ILO (Global employment trends 2012), EIU (2011)